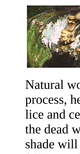
FUNGI



A living tree locks up minerals and nutrients in its bark. When the tree dies and begins to rot, these chemicals are returned to the soil where they will be drawn up by the next generation of trees. Natural wood decay is very slow. Fungi speeds up the process, helped by the insects, beetles, flies, snails, wood lice and centipedes, that penetrate the bark and feed from the dead wood. Dead trees fallen in the moist woodland shade will slowly rot with fungi and insect activity. A tree falling in the open will dry out. In the damp it will take 20 years for a tree to decompose completely. The fungi that develops in the sapwood of the tree bark, is different from the fungi of the heartwood at the centre. This heartwood fungi spreads tiny transparent threads, hyphae, which only become visible when the hyphae produce fruiting bodies, toadstools or bracket fungi. As the tree is hollowed out, it becomes a shelter for bats and owls and nest holes for pied flycatchers and blue tits.

There are two types of fungi, those that digests the compost of decaying plant remains, and those that feed directly from plants and animals.

Compost feeding fungi plays a vital role in disposing of natures waste. Over one ton of plant material falls each year over one acre, which is broken down by the fungi, recycling the nutrients to be taken up by new growth. Fungi cannot photosynthesize, drawing energy from the sun, but depends on the nutrients found in moist soil to grow. It sends thin threads called hyphae into the decaying remains around it, which expand with autumn rain and push out their fruiting bodies, mushrooms and toadstools. Spores are released from the gills of the mature mushrooms and toadstools, blown by the wind, to land and germinate, producing a hypha.

This grows and multiplies, spreading male and female mycelium through the soil as masses of knotted threads, which fuse to produce more spore bearing (basidia) fungi. Trees and fungi grow in a close mutually beneficial relationship, the fungus absorbs sugars from the tree, the tree relies on the fungus to absorb and pass on water and essential minerals. As the fungus spreads far wider than the trees rooted it can collect far more water and minerals than the tree on its own.

LICHENS

Lichens are either pressed up to the bark or push outgrowths away from the bark. They grow in the deep fissures in the barks of oak and polar, but rarely trees with narrow flaking barks like the sycamore.They absorb water over their whole surface. Once fungi has begun the process of decay in a tree bark, they make access for insects to tunnel into the wood, primarily beetles and flies. The grubs of the beetles are the favorite food of the great spotted woodpecker, which often drills its nest into the decaying tree trunk.

Lichens are formed by alga and fungus working together to build a new plant. Algae form the green floating carpet on ponds, fungi are best known as mushrooms and toadstools. In lichens the alga produces the green pigment chlorophyll which manufactures carbohydrates, which the fungus absorbs to trigger its growth, in return protecting the alga from drying out. Lichens vary in color and form, from encrustations to feathery mosses. Lichens grow well in damp woodlands, on the axils of twigs, around the base of trees and on rotting logs, which they use only as support. They do not need to absorb water from the soil and do not need to feed of other plants for nutrients. Different lichens grow on different parts of the tree, and different lichens colonize trees as they age, allowing as many as 200 lichen species to grow in a square mile of woodland. Oak and ash are favorite trees for lichens, with 303 species recorded on oak and 230 species on ash. They are long lived and grow very slowly, indicators to the age of the woodland. Reproduction takes place in two different ways. Vegetative reproduction occurs when fungal threads and algae break off from the parent plant and germinate together, or fungus spores are released to germinate separately forming fungal threads which spread underground to find algae, to unite as lichen. Lichens are classified into three types, crustose, lichens thin and closely prodded into the bark of a tree, foliose, composed of small overlapping leaves, and fruticose, composed of many fingers or branches. As lichens do not have roots, they absorb water and gasses through their upper layers, they are very sensitive to atmospheric pollution.

LIVERWORTS

There are two types of liverwort, lobed and leafy. Small plants that spread quickly, favoring damp places. Lobed liverworts leaves are divided, creeping along the ground with two distinct rows of leaves. Liverworts are self fertilizing producing a capsule on the end of a stalk which when ripe burst open to spread its seeds. They will also spread vegetatively, with special plant tissue on the surface of the leaves, called gemmae, which are dispersed with the falling rain, to grow into a new plant. Most liverworts grow on the ground, while a few will spread across the bark of a tree.

MOSSES

Mosses and lichens, known as epiphytes, grow on tree bark, absorbing nutrients from the air. Mosses and liverworts with curled leaves to trap water form green mats near the moist base of the trunk, higher up, where it is dryer, compact mosses send out stems to trap water. Mosses grow in winter, in cooler damper conditions, producing spore capsules in spring, withering in the summer heat. Moss cushions live for a few months only, replaced from season to season. Mosses have the characteristics of the very earliest plants. They have no leaves, stems or roots. They absorb water over their entire surface rather than drawing it up through the land stem, and are attached to the ground with thin hairlike outgrowths, rhizoids. They grow in water trapping cushions, acting like a sponge. They are self fertilizing, producing spore capsules which dry and release spores that will germinate to produce a new plant. Mosses grow more abundantly on the north side of a tree, out of the wind. Mosses depend on environmental influences to grow, the availability of water, intensity of sunlight, temperature and the nature and permanence of the body on which it is to grow.

Some mosses can draw water directly through their leafy shoots from the tree or the soil they are growing on, others do not have tissues to transmit water but absorb water from their whole surface. Some moss species grow on rocks and walls, able tolerate dry conditions by conserving water. Other species grow better on disturbed soil, spreading quickly to take advantage of temporary habitats. They spread out rhizoids which anchor the plant into the soil, developing moss tubers, which may lie dormant in the ground for several months until their nutrients are needed to feed growth. Other species grow best in the damp conditions of woods, spreading over rotting tree stumps and branches. Many of these mosses grow gemmae at the tips of their shoots, which like the tubers, store nutrients until they are needed.

SPHAGNUM MOSS

grows only where ground is permanently waterlogged. Also grow on trunks and branches of trees, where conditions are permanently damp. Grow in dense carpets. The mosses consist of two distinct sort of cells, the first connecting the plant to the ground, the second, containing chlorophyll, which fuels photosynthesis. The leaves act as water storage reservoirs. The sphagnum moss produces acidic waste, which accumulates in the stagnant water held in the mosses structure. The moss produces sperms that float in the water to find the receptive parts of other mosses. The fertilized seed remains in a capsule holding many spores. The capsule shrinks as the spores loose water. It pops, blowing out the spores that are dispersed on the wind, to fall and produce new bog moss plants.